Baseline Capabilites

Measurement capabilities include the standard meteorological instrumentation, broadband and spectral radiometer suite, and remote sensing instruments. The ARM Mobile Facility (AMF) can accommodate other instruments in addition to, or in place of, the baseline collection.

- 95 gigahertz **W-band ARM Cloud Radar**
- **Micropulse Lidar**
- **Ceilometer**
- **Total Sky Imager**
- **Ground Radiation System,** a collection of radiometers to measure visible and infrared radiation coming from the ground
- **Sky Radiation System,** a collection of radiometers to measure diffuse, global, and direct visible and infrared solar radiation
- **Multifilter Rotating Shadowband Radiometer**
- **Microwave Radiometer**
- **Microwave Radiometer Profiler**
- **Infrared Thermometers**
- **Surface Meteorology Station**
- **Balloon-Borne Sounding System**
- **Atmospheric Emitted Radiance Interferometer**
- **Eddy Correlation System**

Measurements obtained by all these instruments are collected by computers inside an **operations shelter.** This shelter houses the electrical supply hookups, and is equipped with numerous computer stations for data and communication systems. Power availability and reliability is considered on a case-by-case basis, and uninterruptible power supplies are included for backup as needed. Two people are all that is required to monitor and maintain the instruments and ancillary equipment.

Because of its flexibility and portability, the AMF is an ideal platform for conducting collaborative research anywhere in the world.

AMF Science

The purpose of the AMF is to collect essential information about cloudy and clear atmospheres in under-sampled climatically important regions. In some of these regions, even the macroscopic cloud structure is relatively unknown. The AMF will produce data sets for use by the atmospheric community to test and improve parameterizations in global climate models. Data from the AMF instruments will be processed using specialized routines that will produce cloud and clear-sky data products specifically designed to address the scientific issues in a particular climatic region.

The AMF is designed to collaborate with experiments (especially those involving aircraft) from other agencies. Another key benefit is the ability to host instruments other than the baseline collection.

Details on the AMF proposal process can be found at http://www.db.arm.gov/cgi-bin/IOP/iops.pl.
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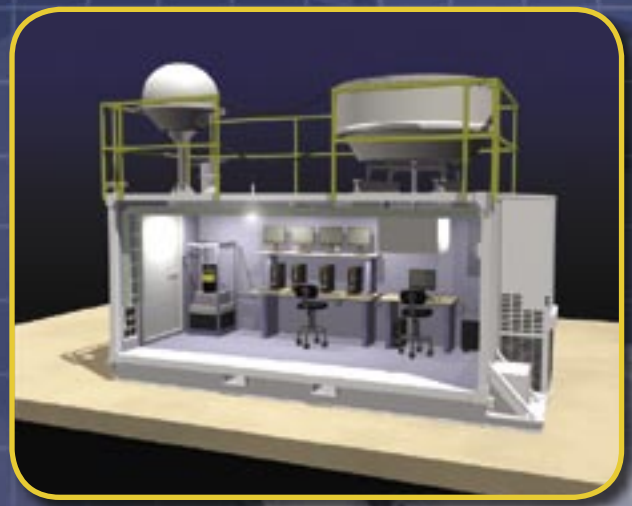
AMF
ARM MOBILE FACILITY

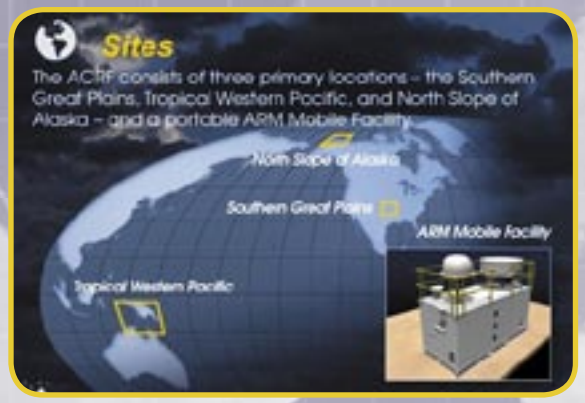


Atmospheric Radiation Measurement
Climate Research Facility
U.S. Department of Energy

http://www.arm.gov/sites/amf.stm

Overview

The U.S. Department of Energy's Atmospheric Radiation Measurement (ARM) Climate Research Facility (ACRF) maintains field sites in Oklahoma, Alaska, and the tropics to obtain continous measurements of cloud and radiative properties for improving climate models. In addition to these fixed sites, the **ARM Mobile Facility (AMF)** provides a flexible instrument platform for conducting atmospheric experiments lasting from 6 to 12 months in any environment, from the cold of the Arctic to the heat of the tropics.



Typically consisting of two lightweight shelters, a baseline suite of instruments, data communications, and data systems, the AMF is easily transported. One shelter is the operations shelter, housing the data systems, communications, instrument computers, and several instruments. The other shelter is primarily a maintenance facility for instrument repair and calibration, and can also be used to house additional instruments. It also provides storage for tools, spare parts, and shipping materials. An experienced two-person team is deployed with the facility to set up and maintain the shelters and instruments.

Deployment #1: Point Reyes, California, USA

Beginning in March 2005, the AMF is taking part in a 6-month field campaign to study the microphysical characteristics of marine stratus and, in particular, marine stratus drizzle processes. In collaboration with the U.S. Office of Naval Research and the U.S Department of Energy's (DOE's) Aerosol Science Program, the objectives of the Marine Stratus, Radiation, Aerosol, and Drizzle project are to make observations of cloud aerosol interactions and to improve understanding of cloud organization often associated with patches of drizzle.

To help fill information gaps in the existing limited surveys of marine stratus microphysical structure, the AMF will contribute significantly to the scientific objectives of this project by providing state-of-the-art active and passive remote sensors to measure the detailed microphysical structure of drizzle patches and the associated clouds as they move onshore. Marine stratus clouds are known to be susceptible to the byproducts of fossil fuel consumption, a multi-agency climate change priority.

Point Reyes was chosen due to its marine environment, as well as its accessibility for scientific research endeavors. Point Reyes National Seashore is home to the Pacific Coast Science and Learning Center, established by the San Francisco Bay Area Network of National Parks. The center provides office space, housing, data, reports, coordination, and logistical support for researchers performing projects within Bay Area parks.

Deployment #2: Niamey, Niger, Africa

In 2006, the AMF heads to West Africa to participate in the "Radiative Atmospheric Divergence using ARM Mobile Facility, GERB data and AMMA Stations" project. As part of this project, better known by the abbreviation RADAGAST, the AMF will be deployed beneath the Geostationary Earth Radiation Budget (GERB) instrument on the Meteosat satellite. The deployment will be timed to coincide with field phases of the African Monsoon Multidisciplinary Analysis (AMMA) experiment, in which extensive airborne and surface measurements will be made in the region of the deployment site. This will enable the first direct measurements of the divergence of

solar and thermal radiation across the atmosphere, combined with measurements of the corresponding atmospheric structure, using the temporal sampling necessary to address fundamental questions related to radiative forcing of climate.